SYSTEM AND METHOD FOR GENERATING ELECTRONIC DOCUMENTS HAVING INDEPENDENTLY FORMATTABLE REGIONS

Field of the Invention

The invention relates to documents having independently formattable regions. More particularly, the invention relates to structuring separate regions with selective attributes within a single document.

Background of the Invention

The advent of the Internet and World Wide Web within the Internet has increased the demand for more sophisticated types of document presentation. For example, users sending and receiving information over the Internet or other network often expect to see a document having a number of different presentation styles in order to distinguish between different types of information. For example, a user viewing an HTML mail application may see a document divided into a header and a footer. Similarly, a person viewing a web site may see an upper column having advertising, a right row having a site index, and the remainder of the web site comprising the body of text.

As illustrated in Figs. 1(a) to 1(c), present systems and methods require that a user create a plurality of documents in order to present a single document having independently formatted regions. Fig. 1(a) is the index file that provides the structure of the regions, while Figs. 1(b) and 1(c) provide the content. Once the source code for each of these documents is transmitted to a terminal device, such as a computer with a web browser, a document is rendered having the appearance of the document in Fig. 2. Thus, portions of a conventional document are stored as separate HTML files which the system must assemble in the right sequence to prepare an email or other framed page, and changing or editing one of the HTML files does not automatically ensure that other fields will be properly conformed.

These and other drawbacks exist with other systems.

Summary of the Invention

The invention overcoming these and other problems in the art relates to a system and method which generates freely programmable electronic documents having independent regions with their own attributes.

An object of the invention is to provide an system and method that generates a unified document having independent regions, while storing the entire document in a single file.

Another object of the invention is to provide a system and method that permits consistent editing of electronic documents, without the necessity to make corresponding edits through multiple files.

Another object of the invention is to provide a system and method which generates electronic documents having arbitrary sets of frames, fields or panes which can be adjusted according to user requirements.

According to one embodiment of the invention, the presentation of a document onscreen is governed by a document management file, containing records controlling all attributes of individual portions of the document. Using this unified file structure, a file can be decomposed into an arbitrary number or regions or frames, without resorting to individual descriptors stored in separate files. Email documents can, for instance, be broken down into as many regions as desired, each of which may be separately scrolled or otherwise processed.

Brief Description of the Drawings

Figs. 1(a) to 1(c) illustrate the implementation of regions using existing systems and methods.

Fig. 2 is an illustration of a document rendered from the source code of Figs. 1(a) to 1(c).

Fig. 3 is an illustration of a document management file in accordance with an embodiment of the present invention.

Fig. 4 is an illustration of a document management table in accordance with another embodiment of the present invention.

Fig. 5 is an illustration of a document rendered from the source code of Fig. 4.

Detailed Description of Preferred Embodiments

One embodiment of the invention relates to the presentation of an document in a mark-up language, such as HTML document as shown in Fig. 2. In Fig. 2, a document is provided having a header and a body section. The header and body section may have different formatting, different default attributes, or other different attributes.

It will be appreciated that other formats for document are contemplated by the invention, and that indeed free programmability of the document structure is an object of the invention. It will likewise be appreciated that the invention is intended to be operable with all types of electronic documents, including word processing files, email documents, Web-related pages, and in general any type of electronic formatting benefiting from improved formatting.

Fig. 3 is an illustration of the source code of a document management file 300 in accordance with an embodiment of the present invention. Various characteristics of the present invention may be the same as characteristics of existing systems and methods, such as the <html> tag at line 301 and the <head> tag at line 302. In a preferred embodiment, the present system may provide the source for the frameset in the same document management file as the frame structure. For example, in line 306, the system may extract the content of the header source from lines 310 to 312 of the same file. Similarly, the system may extract the content of the body source from lines 313 to 315.

In addition to providing content for the regions in a single file, as shown in Fig. 3, the system may also associate various attributes with the content. For example, in addition to associating the text "This is the header" with the header source, the system may also associate various attributes such as character formatting (font size, default language or color), region formatting (background color, default language or default character formatting), other attributes associated with text or regions, or a combination thereof. For example, a document may have one region that has a default language of Japanese, a white

background, and black text, and a second region that has a default language of English, a black background, and white text.

In a preferred embodiment, additional functional attributes may be associated with a region. For example, an "input" attribute may create an input field in a particular field, while an "email address" attribute may identify the region as containing at least one email address. These function attributes may have default format attributes associated with them. For example, an "email address" attribute may have a predetermined color and underlining attribute associated with. An example of a function associated with an "email address" function attribute is that when a positional indicator comes into a predetermined relationship with a region, the cursor may change appearance and allow a user to create an email addressed to a particular email address. This functionality may be similar to the functionality of an HTML "mailto" tag (<A HREF="mailto:mike@lotus.com">Mike</A>).

Fig. 4 is an illustration of a document management table 400 in accordance with another embodiment of the present invention. Specifically, Fig. 4 is an example of implementing the independent formatting of regions through the use of tables. Row 410 may provide a description of or name for the type of information provided by each column. Each of the other rows (Row 420 and 430) may provide a different record to which the information relates, whereas each of the columns may indicate a different type of attribute information that is being provided by the source code.

For example, Column 401 may specify a name for a region or record. Column 402 may provide the content of the record. Column 403 may provide the character attributes of the record. Each of the fields may provide information that establishes how a document is rendered at a terminal device. For example, field 421 provides the information that the record is named "header," while field 422 provides the information that the content is "This is the header". In a preferred embodiment, a document management table 400 may have region attributes associated with a name. For example, a record

named "header" may be placed at the top of a document covering 20% of a screen when rendered whereas a region named "body" may be placed at the bottom of the document covering the remaining 80% of a screen when rendered. Such region attribute defaults may be overridden by specifying new attributes in

5   an attribute field. Additionally, if there is no default region attribute, any attribute relating to a record may be placed in an attribute field associated with the record.

Additional rows, columns and fields may be provided. Furthermore, other methods of assigning attributes may be utilized, such as drop-down boxes,

10   check boxes, or other attribute selection methods. In a preferred embodiment, the information provided in each of the fields may be linked information. For example, if a document is going to display the telephone number of a person associated with a document, a link to the person's telephone number may be provided in Column 404. A record may contain a link to another document or

15   database that contains the information that is to be rendered when the base document is rendered.

Fig. 5 is an illustration of a document rendered from the source code of Fig. 4. Specifically, the content and the attributes associated with each of the records is applied to the document. In a preferred embodiment, the source code

20   of Fig. 4 may be translated at a server prior to being transmitted over a network. For example, a first server may read the source code of Fig. 4, translate it into another language, such as HTML, and deliver it across a network. For this embodiment, the system may develop a plurality of documents from the original document management table 400 prior to transmitting the document across the

25   network in order to comply with the formatting requirements of a receiving device. In another embodiment, the source code of Fig. 4 may be translated to HTML or other language once the document has been created. Furthermore, in another embodiment, the web browser or other application that is being used to render the document may translate the source code of Fig. 4 directly to render a

30   document as shown in Fig. 5.

In terms of network processing, in the practice of the invention the reading of the document management file 300 is preferably carried out by a client workstation or other communication device (not shown) connected to a server over any available communications link, such as dial-up modem, Ethernet, T1 or T3 lines, ISDN connections or others. The client workstation may be a personal computer running Microsoft Windows™ 95, 98 or NT™; a Unix or Linux workstation; a Web appliance such as Sony WebTV™; or other computing or communication devices. The document is physically transmitted from the server to the client workstation at login, upon request by the remote user or at other times.

The adjustments to the configuration of the email document can be done by a systems administrator at the server, or by the user at the client computer for local use or uploading. The records and attributes of document management file 300 can be coded using conventional languages such C++ or Java, or using special purpose markup languages directed to formatting of the resulting electronic document. Regardless of the specific type of document presented, in the invention not only are all governing attributes stored in a single file but any region and attribute in a region can be freely programmed, resulting in a fully modifiable document structure. In a preferred embodiment, none of the regions of the document are hardwired to a format that can not be adapted.

The foregoing description of the system and method of the invention is illustrative, and variations in configuration and implementation will occur to persons skilled in the art. For instance, while the invention has been described with respect to an email document broken down into the two main portions of a header and body, in practice any electronic document can be prepared and processed using the invention. An electronic document generated according to the invention can be decomposed into any number of regions in arbitrary configuration. For instance, a document with 10, 20 or any other number of regions could be created. The scope of the invention is intended to be limited only by the following claims.